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ABSTRACT This report describes summer wild turkey population index trends and summer productivity (via summer turkey sightings), and spring and fall wild turkey harvests, which are used to formulate wild turkey harvest management recommendations. We also calculate harvest by week to monitor the impact of season length on harvests, and determine the age structure of the harvests to monitor the change in age structure of the turkey population. The statewide index of turkeys seen by Wildlife Conservation Officers in 2012 (16.8 turkeys seen/1,000 mi.) was 27% below the previous 10-year average (23.0). The highest index year was 2002 (31.1). Recruitment ratio (poults/all hens observed) was the same as 2011 (1.56) but below the previous 4-year average (2.12). Delayed nesting may have contributed to lower overall recruitment and lower average brood size (3.92). This lower recruitment could also be indicating that wild turkey populations are reaching habitat carrying capacity. Spring 2012 harvest density of hunters' first harvest (0.74 turkeys harvested/mi^2) was similar to 2011, but 12% below the previous 10-year average (0.84). The highest harvest density was 1.09 in 2001, and the lowest was 0.70 in 2010. The spring 2012 season was the seventh year a special turkey license could be purchased to allow harvest of a second bearded bird, statewide, one bearded bird per day, with mandatory reporting regardless of success. It was also the third year hunters could purchase the license over the counter at the time of purchasing their general hunting license. Sales totaled 13,142 and increased 59% from the previous average. The estimated harvest (1,795) was 12% lower than the previous 3-year average since the limit on sale date was lifted (2,049). The harvest did not increase as license sales did, which likely indicated that many casual turkey hunters bought the special license due to its availability. In a continued effort to increase fall turkey hunting participation, the Board of Commissioners approved maintaining 2 fall turkey season segments for 18 of the 22 Wildlife Management Units (WMUs). Average fall 2012 harvest density by

WMU (0.31 turkeys harvested/mi^2) decreased 42% from the previous 10-year average (0.53) and was the lowest on record. Fall harvest densities have been decreasing since they peaked in 2001. Fall season lengths have been shortened in most WMUs since 2004, hunter participation has been decreasing, summer sighting indices have been below average the past 3 years and the mast crop has been abundant during the last six autumns in many parts of the state, all contributing to lower harvests. Similar to spring season the highest percentage of fall harvests occurred during the first week of the season, 33-37%, but harvests decreased only slightly between the second and third weeks in the 3-week units (17% and 15%, respectively), demonstrating that hunters utilize the entire season. Results from the tri-state spring harvest rate study show a hunter preference for harvesting adult gobblers over juvenile males during the spring season. The age structure of the spring 2012 harvest comprised 13% juvenile males and 84% adult males (3% bearded females). The 2012 one-day spring youth hunt accounted for an average 8% of the overall reported harvest by WMU. The first week harvest of the regular spring season (Saturday–Friday) comprised 44% of the overall season harvest, which was similar to the average. The last 2 weeks of the season averages about one-quarter of the harvest demonstrating that, although harvest decreases, hunting participation persists throughout the season. All-day spring turkey hunting for the second two weeks of the season (one-half hour before sunrise until one-half hour after sunset) was approved in 2011. Afternoon harvests comprised 5% of the total reported harvests and 20% of harvests during the all-day portion of the season, but 80% of harvests during the all-day season occurred by noon, which were similar to 2011. For the 2013-14 seasons, the Board of Commissioners approved switching the 2- and 3-week seasons for WMUs in the hen wild turkey study to determine the effect of season length on hen harvest rates. As per staff recommendations the Board approved decreasing fall season length in WMU 1B from 2-weeks to 1 week, and maintaining the 3-day Thanksgiving holiday season for WMUs with 1-week or longer seasons, the 3-day (Tuesday–Thursday) fall season in WMU 5A, and the closed fall seasons in WMUs 5B, 5C and 5D. No changes were proposed or made to the spring 2014 turkey season.

OBJECTIVES

1. To determine summer wild turkey population index trends by Wildlife Management Unit (WMU).

2. To determine spring and fall turkey harvest trends by Wildlife Management Unit (WMU).

3. To use trends in summer turkey sighting indices and spring harvests to formulate turkey harvest management proposals.

4. To determine age structure of spring and fall harvests to monitor the change in age structure of the turkey population.

5. To calculate the spring and fall harvest by week to monitor the impact of season length on the harvest.

METHODS

Wildlife Conservation Officer Summer Sighting Surveys

Wildlife Conservation Officers (WCOs) have been conducting summer turkey sighting surveys during June, July, and August, annually, since 1953. This provides a trend index for summer turkey population levels by WMU. Since 1990, while conducting routine business during daylight hours in their assigned patrol vehicles, WCOs have kept daily records of the number of turkeys seen and miles traveled by WMU. In addition, officers record the total turkeys reported to them by other people. WCOs email completed monthly data forms, in Excel spreadsheets, to the Regional Wildlife Management Supervisor, who forwards the Regional data to the wild turkey biologist.

Using macros written in the Excel computer program by retired WCO Daniel Clark and the wild turkey biologist, the index of turkeys seen per 1,000 miles driven was calculated for each district. (Note: Prior to 2005, the index was calculated by 1,000 km, but was converted to 1,000 mi to be consistent with how the data are reported in the Management Plan for Wild Turkeys in Pennsylvania, 2006-2015, Casalena 2006.) Prior to 2005, district calculations were assigned to one particular WMU even if the district contained more than one WMU. For these cases, I assigned the district sighting index to the WMU that comprised the largest percentage of the district. Beginning 2005, all WMUs within the district were used (up to three WMUs), with appropriate miles driven and birds seen for each WMU recorded separately for that district. This provides more accuracy in data and larger sample sizes for calculating sighting indices by WMU.

Additionally, the calculation of average number of birds seen/1,000 mi driven in a WMU was changed. Rather than keeping the district as the sample unit and averaging turkeys per 1,000 mi driven over all districts within a WMU, I divided total birds seen by total miles driven per WMU to calculate a weighted average of birds seen per 1,000 mi driven by WMU.

Index values for each WMU were compared to the previous year using the Wilcoxon signed rank test in the Systat software package (Wilkinson 1990). This method of analysis required that WCO district index values be paired between years; therefore, averages for all index values in a WMU were based on matched pairs for the years being compared. Consequently, the index averages for WMUs in these comparisons may differ from WMU index values for the current year because of missing district data (usually due to illness or a vacant district). I provide sighting indices since 1995 for determining long-term trends in the summer turkey population, whereas comparisons between this year and last provide information on short-term changes.

Productivity

Since 2005 the Game Commission has been estimating reproduction and recruitment of wild turkeys in Pennsylvania via the WCO summer turkey sighting surveys. From 2005-2007 WCOs documented adults, juveniles and unknown age turkeys they sighted during June and July. We assumed age differentiation during August was too difficult because early hatched poults would be almost full grown. These data, however, were not adequate for specific productivity calculations. Since 2008 WCOs have documented poults (young turkeys) seen with and without hens, hens seen with broods, hens without broods and adult gobblers. This allows

calculations of productivity via brood size (poults per hen) and recruitment ratio (poults per all hens, i.e., hens with broods plus lone hens) for estimating overall reproductive success and population size. Recruitment ratio is a measure of young entering the population based on the number of hens in the population.

Harvest Trends

The Game Take Survey, initiated in 1971, (Johnson et al. 2012) is annually mailed to 2% of Pennsylvania hunters after small game seasons have ended. The survey provides annual fall and spring turkey harvest estimates by WMU. In 1973 mandatory reporting of turkey harvests via postage-paid report cards was instituted. A computerized licensing and harvest reporting system was instituted statewide in 2009 with an online reporting option, and telephone reporting via voice recognition was instituted beginning with the spring 2010 season. Hunters now have three options for reporting wild turkey (and deer) harvests: the postage-paid report cards issued with each license (except for 2009 when report cards were not yet added to the new computerized licenses), on-line and telephone. Reporting rates are increasing and we are monitoring this. Reporting rates are calculated by cross-reference between the reported harvest and what was reported on the Game Take Survey.

In 2009 Game Take Survey methodology was changed to improve precision with harvest results for the spring turkey season. Survey mailings began in February, prior to the next spring hunting season, instead of April, which reduced memory-bias of reporting incorrect harvest year for the spring season. Also, the new Customer Identification Number (CID) associated with the computerized licensing system began to be used to cross-reference between the reported harvest and what was reported on the Game Take Survey. Previously hunter license numbers changed each license year and cross-reference for the spring season used hunter name match due to the licensing year cycle of July 1 – June 30. This change alone increased spring season reporting rates because spelling of hunters' names no longer influenced the cross-referencing.

Although the 2009 changes corrected several problems with spring harvest data collection, some level of memory bias may have remained an issue due to the 8-9 month gap between the end of the season and distribution of the survey. Also, we now believe that for an unknown numbers of years before and after the 2009 changes, report cards from the incorrect spring season were cross-referenced with Game Take Survey responses, which also resulted in artificially lowered reporting rates.

In 2012 the Game Commission initiated a separate annual Spring Turkey Hunter Survey to estimate number and geographic distribution of spring turkey harvest and hunter effort. Surveys (mail + web-based) are distributed immediately following the season to acquire more timely data for season and bag limit recommendations and eliminate the previous errors in data collection. Surveys are sent to all licensed hunters who indicated on previous Game Take Surveys that they plan to hunt spring turkey season, as well as a random sample of remaining hunters for a total sample of approximately 10,000 hunters. These survey changes and improvements in data cleansing have resulted in reporting rate increases averaging 155% for the spring season and 61% for the fall season, which have resulted in lower estimated harvests (when calculated from reported harvests) since 2010. Even though Game Take Survey methods changed beginning the 2009-10 season, increases in reporting rates did not occur until the 2010-

11 season because report cards were not issued with licenses the 2009-10 season, but report cards were again issued beginning the 2010-11 season. We believe the Game Take and Spring Turkey Hunter Survey data from 2009-present provide more reliable estimates of total harvest and harvest density than those calculated from reported harvests during this same timeframe, due to the changes and corrections made to the Surveys. However, reported harvest estimates are available sooner than Survey data and continue to be used for preliminary harvest calculations. Also, the reported harvest data (corrected for reporting rates) continues to be our only source of information regarding harvest by week, day, and time of day, which are important parameters for management.

In 1995 the Game Commission divided the state into 12 Turkey Management Areas (TMAs) for setting fall hunting season lengths, based on habitat, turkey population densities, hunter participation, hunter access, winter weather severity, and human demographics. These were in place until 2003 when 22 WMUs were created, based on ecological and human population density characteristics, for managing all game species, except elk and federally regulated migratory game.

I reported the spring and fall harvests for each WMU from 2006 to present because beginning 2006 spring turkey hunters were permitted to harvest a second bearded turkey with the purchase of a special spring license, mandatory reporting regardless of success or use. From 2006 to 2010 we mailed reminder letters to 1,000 randomly selected special spring license holders who did not report. During those 5 years on average 95% of purchasers who did not report did not harvest a second turkey. Harvest estimates are adjusted to account for this additional harvest. We will conduct the survey every 5 years, beginning 2015, to determine if the non-reporting average remains the same.

Through 2008, I calculated spring and fall wild turkey harvest density (turkeys harvested/mi^2) for each WMU from the reported kill corrected with the 3-year rolling average statewide harvest-reporting rate. A statewide reporting rate is used because sample sizes are not large enough to calculate reporting rates by WMU (Drake 1998). Due to recent improvements in the Game Take Survey, and the Spring Turkey Hunter Survey, and the still undetermined effect these have on reporting rates for converting reported harvests to total harvests, I used Game Take Survey results to determine harvest densities from 2009-11 and Spring Turkey Hunter Survey results beginning 2012.

I determined the trend in harvest and harvest density for each WMU by comparing the current year's data with the previous 3 years and long-term (10-year) trend. Spring harvest trends are used for determining population trends because the spring season is statewide and a fixed length. Fall harvest trends are less indicative of population trends because fall hunting season lengths vary by WMU, and fall harvests are dependent on weather, food availability, and recruitment. Fall harvest trends are reported to track changes in fall harvests in relation to changes in fall season length, mast crop, hunter effort, weather conditions during the season, and recruitment.

Age Distribution of Harvest

Beginning with the 2002-03 Game Take Survey, age structure of the harvest (beard and spur length) was collected for fall and spring seasons. I grouped the data by sex and unknown according to hunter reports. Males were grouped into 3 age classes; 1-year-old, 2-year-old, and 3-years or older, based on a combination of spur length and beard length (Dickson 1992). I used both measurements to provide a check of the hunter-based data. I used the following criteria for male age determination for the spring Game Take Survey and Spring Turkey Hunter Survey harvest:

Age	Beard	Spur	Notes
1-yr old	<6"	<0.5"	If <5" beard & spur >0.5" unknown age. If 2-3" beard & spur 0.5" = 1
2-yr old	6-9"	0.5-0.99"	If 5-6"beard & spur >0.5" = 2yr. If 9-10" beard & spur <1" = 2-yr.
3-yr +	>9"	>1"	If 5-9" beard & spur >1" = 3-yr.
Female	7-9	0.0-0.25	If >5" beard & 0" spur = Female
Unknown Age:			If beard present & spur 0"; If 0" beard & spur present; If <5" beard & spur >1"

From these criteria, for the spring harvest, I calculated the percentage of each age class in the harvest, which provided information on the age structure of the population, and helped verify the previous two years of summer sighting data and recruitment. I also determined the juvenile (1-year-old): adult (2-years and older) male harvest ratio to compare to data from other northeastern states.

Beginning in 2006 turkey sex also was collected for the fall season harvest in order to correctly distinguish females from juvenile males in the fall harvest to allow us to determine age and sex composition of the fall harvest for our wild turkey population model. Fall harvest composition was not analyzed and reported until this year. The female category most likely contains some juvenile males that had not yet grown distinguishable beards and spurs at the time of harvest. Therefore the female and unknown sex categories can be grouped. I used the following criteria for sex and age determination for the fall Game Take Survey harvest:

$0 \leq$ Spur length $\leq 0.25"$
    No Beard
        Reported M = Juvenile Male
        Reported F/Unknown = Female
    $0 <$ Beard $< 4"$
        Reported M/Unknown = Juvenile Male
        Reported F = Female
    Beard $\geq 4"$
        Reported M/F/Unknown = Female

$0.25" <$ Spur $< 0.875"$ (7/8" in fall should be 1" by next spring)
    $0 \leq$ Beard $< 5"$
        Reported M/F/Unknown = Unknown Male
    Beard $\geq 5"$
        Reported M/F/Unknown = 1.5 Year Male

Spur $\geq 0.875"$

    0 ≤ Beard < 5"
        Reported M/F/Unknown = Unknown Male
    Beard ≥ 5"
        Reported M/F/Unknown = 2.5yr+ Male

Harvest by Week and Time of Day

Harvest by day and week are obtained to determine the influence of season day and the effect of different season lengths for helping guide season length proposals. Data are taken from date of kill which is included on harvest reports, and summarized by WMU for spring and fall seasons.

Time of day during spring season is collected to track the percent of the harvest that occurs during the all-day portion of the season. Harvest time is obtained from harvest reports and summarized by WMU.

Turkey Season Proposals

For fall season proposals, the Bureau of Wildlife Management (BWM) analyzes the trends in the preliminary spring harvest density data as well as trends in summer sighting indices by WMU. Spring harvest density calculations and summer sighting indices are independent of each other, and we assume that their trends are indicative of the trend in turkey populations. We use guidelines for making fall season length proposals from the turkey management plan (Casalena 2006). The Board of Commissioners considers agency staff proposals in conjunction with other issues (such as input from the public), and gives preliminary approval to all seasons and bag limits at the January meeting for a 60-day public review. Final adoption is made at the April meeting for the following fall and spring seasons. Once a regulation change is made, the BWM recommends the change remain in place for 3-5 years in order to assess any trends in population due to the change.

RESULTS

WCO Summer Sighting Surveys

The statewide index of turkeys seen by WCOs in 2012 (16.8 turkeys seen/1,000 mi.) was 8% lower than 2011 (18.3), as well as 17% below the previous 3-year average (20.2) and 27% below the previous 10-year average (23.0), which includes the highest index on record, 31.1 turkeys seen/1,000 mi in 2002 (Tables 1 and 2). The lowest sighting index on record was 16.4 in 1996, prior to the population restoration efforts in southeastern Pennsylvania. The 2012 index was only 3% higher than that of 1996. Although spring weather conditions in 2012 during the normal peak of hatch were mainly drier than the previous 3 years (2009–2011), weather in early spring was cool and wet, which delayed nesting of our radio transmitted hens (Casalena 2012). This delay in nesting may have resulted in decreased sightings throughout the summer.

At the WMU level the 2012 sighting index decreased significantly from 2011 in WMU 1B and 5C, increased significantly in WMU 2F, and was statistically similar for the remainder of WMUs, although the decrease in WMU 4B was almost significant (Table 3). When compared district by district the 2012 and 2011 statewide sighting indices were similar, with 73 WCO districts (37%) recording more sightings in 2012, 101 districts (52%) recording less sightings in 2012 and 21 districts (11%) recording the same number of sightings both years.

Productivity

Statewide wild turkey reproduction in 2012, as determined by the number of poults entering the population per all hens in the population, was the same as 2011 (1.56) but below the previous 4-year average (2.12; Table 4). Delayed nesting may have contributed to lower overall recruitment and lower average brood size (3.92; Table 4). Turkey recruitment varies considerably annually, mainly due to spring weather and hen body condition during the nesting season. Although recruitment is hard to control through management practices, maintaining the opening of the spring season to coincide with nest incubation, along with conservative fall seasons are important for population management (Casalena 2006). Lobdell et al. (1972) calculated that a mean of 3.03 young per adult female (range 2.28 – 3.78) is needed to maintain a population of 1,000 turkeys for a 100-year period. These conclusions might be out-dated because their modeling was based on expanding turkey populations. The declining productivity in Pennsylvania may be indicative of density-dependent effects on reproduction, especially in some WMUs (McGhee 2006).

At the WMU level, the recruitment ratio improved over 2011 in half (11) of the WMUs demonstrating annual variability (Table 4). However, if we consider a recruitment ratio of 2.0 as the replacement needed for stable populations, 16 WMUs were at this level in 2008, whereas 10 were at this level in 2009, 9 WMUs in 2010 and 2011 and only 4 WMUs in 2012, showing the decreasing trend. Recruitment ratio did not exceed 3.0 in any WMU in 2012.

Spring Harvest Trends

Spring 2012 marked the seventh year hunters could harvest a second bearded bird in the spring with the appropriate license, and the third year hunters could purchase the license over the counter at the time of purchasing their general hunting license until the day before the season opened. Previously sales were restricted to 1 January–1 April for administrative purposes. Since then sales have increased 59% from the previous average. Hunters purchased 13,142 special turkey licenses (15,159 in 2011; 13,599 in 2010; 10,720 in 2009; 8,795 in 2008; 7,585 in 2007; 8,041 in 2006). The 2012 estimated second harvest (1,795) was 12% lower than the previous 3-year average since the limit on sale date was lifted (2,049), but total sales were similar to the previous 3-year average. This likely indicated that many casual turkey hunters bought the special license simply because of availability. Previous harvests were 2,045 in 2011; 1,941 in 2010; 2,161 in 2009; 1,954 in 2008; 1,507 in 2007; 1,454 in 2006. Success rate for all special license purchasers (13.7%) was similar to 2011 (13.5%) but 15% less than the previous 3-year average (16.0%) and has decreased from the average when license sales were limited (20.1%). While overall spring harvests have decreased during the last three years some of the decrease in success most likely is due to the increase in license sales, with many hunters not having the opportunity to use this license. Actual success rate for special license purchasers who actually hunted a second turkey was 45% in 2012, down from 57% in 2011. However, it is unknown if this is a representative figure because 2011 was the first year we included the question on the Game-Take Survey. We will continue to track this success rate. In comparison hunter success rate for the first turkey was 16% in 2012. Six percent of wild turkey hunters purchased a 2012 special license, similar to 2011 and up from an average of 4% when sales were restricted to a shorter sales period. Similarly the overall harvest that the special license harvest comprised increased from 4% to almost 6% during the same time frame.

According to the Spring Turkey Hunter Survey, an estimated 9,841 juniors hunted the 1-day 2012 youth spring season compared to 12,710 in 2011. Prior years the data were obtained from the Game-Take survey and 8,096 juniors participated in 2010, 7,354 in 2008 and 5,911 in 2007. Number of youth hunters in 2009 could not be accurately calculated. Participation has been increasing since 2007. According to the Spring Turkey Hunter Survey 11% of all youth license holders participated in the youth season (9,841 of 88,057), 27% of which harvested a turkey. During 2011 14% of youth participated but success rate was only 12.5%. Youth season harvest has been 2,638 in 2012, 1,588 in 2011, 1,478 in 2010, 1,772 in 2009, 1,638 in 2008, and 1,650 in 2007, which has averaged approximately 5% of the total Spring Turkey Hunter Survey harvest, or 7% of the total reported harvest (J. Johnson, pers. comm.).

The mentored youth program tends to have even more youth participants. This program allows adults to take youth under 12 years of age hunting throughout the entire spring gobbler season. According to the 2012 Spring Turkey Hunter Survey, mentored youth harvested 1,244 turkeys during 22,047 days. We did not determine the total number of mentored youth turkey hunters in 2012. For the 2011 Game-Take Survey we did not ask questions about mentored youth (Johnson et al. 2012). Previous years results are: in 2010 15,727 mentored youth harvested 2,208 spring gobblers during 29,217 days; in 2009 an estimated 17,660 mentored youth harvested 3,671 turkeys during 37,599 days; in 2008 an estimated 15,172 harvested 3,606 gobblers during 30,523 days; and in 2007 the number of mentored youth was not calculated, but mentored youth harvested 3,496 gobblers during 52,032 days (Boyd and Weaver 2007, Boyd and Weaver 2008, Boyd and Weaver 2009, Boyd and Weaver 2010, Boyd and Weaver 2011).

According to the 2012 Spring Turkey Hunter Survey, the number of spring turkey hunters, 216,225, decreased 4% from 225,718 in 2011, 6% from the previous 3-year average (230,553) and 7% from the previous 10-year average (232,017). Hunter success, for hunter's first harvest, (16%) was slightly higher than last year (15%), similar to the previous 3-year average, but 7% less than the 10-year average (17%). Highest hunter success was in 2001 at 21%. Days hunted for the first turkey (1,003,405) increased 7% from 2011 (937,987), 4% from the previous 3-year average (966,117), and 3% from the previous 10-year average (972,310). Hunter days varies by year, likely due to weather during the season and hunter success, which in turn are affected by hunter density and age structure of the turkey population. Additionally, the change to the Spring Turkey Hunter Survey in 2012 may partially explain differences. Spring hunter days has ranged from 781,499 (1991) to 1,103,556 (1996; Boyd and Weaver 2010, Boyd and Weaver 2011, Johnson et al. 2012).

The final 2012 Game-Take spring harvest, including the youth season and second harvests was 35,652 (Table 5, Johnson et al. 2012). This was similar to the 2011 harvest (35,015), but 6% below the previous 3-year (37,843) and 7-year averages (37,984), which includes the full length of time we have permitted two birds in the spring with purchase of a special license (began in 2006). We believe this decrease partially is a reflection of changes in hunter survey methodology and analyses and these figures may be more accurate harvest estimates than previous results (R. Boyd, pers. comm.). Additional years of data are necessary to verify. Now that the Spring Turkey Hunter Survey is distributed immediately following the spring turkey season, accuracy of reporting and recording the correct year of harvest have

increased and reporting rates have increased. Because of the increased reporting rates since 2010 spring harvest estimates based on reported harvest corrected for reporting rate have shown larger decreases than that of the Game-Take harvest compared to the previous average. The 2012 reported initial spring harvest (i.e., does not include second bird harvests) corrected for a 50.5% reporting rate was 15,875. This was 30% lower than the spring 2011 initial spring harvest corrected for a 35.2% reporting rate (22,813), 41% lower than the spring 2010 initial spring harvest corrected for a 31.7% reporting rate (26,929), and 56% lower than the previous 10-year average (36,359). From the years 2000-2004 reported initial spring harvests corrected for reporting rate were above 40,000 gobblers, then again from 2008-2009 (Casalena 2010). But those years were prior to survey changes. We do believe initial turkey harvests were high those 7 years because the highest turkey summer sighting indices were documented from 1999-2002 and substantiates that summer sighting indices positively predict spring harvests at a two-year lag because 2-year old gobblers are most susceptible to spring harvest. Summer sighting indices increased again in 2006 and 2007, correlating with the above average spring harvests in 2008 and 2009. Summer sighting indices have been below average since 2009, indicating harvests should have decreased, but not by the amount indicated from reported harvests. Therefore, previous reported harvests could be overestimated.

The statewide spring 2012 harvest density was 0.74 turkeys/mi^2 from the Spring Turkey Hunter Survey harvest estimate (Table 7). This was similar to 2011 (0.73) and 12% below the previous 10-year average (0.84; Table 6, Table 7). The highest statewide harvest density was 1.09 in 2001, and the lowest was 2010 (0.70; Table 6, Table 7). Compared to the other 12 states in the northeast, Pennsylvania consistently exhibits the highest average spring harvest and harvest per *forested* square mile (Table 8; Massachusetts Division of Fisheries and Wildlife 2013). Comparing the 5-year (2008-2012) average spring harvest to that of 2012, Pennsylvania's annual percent turkey population growth rate is decreasing (Table 8). Of the 13 northeast states, 7 show decreasing population growth rates compared to the 5-year average. Connecticut, New Jersey, and Pennsylvania show moderate decreases, whereas New York, Rhode Island, Vermont, and West Virginia show significant decreases. Turkey populations are stable in Maine, New Hampshire and Virginia, while Maryland and Massachusetts populations are increasing. The only northeast state where turkey population growth rate continues a strong increase is Delaware.

WMU Based Harvest Trends

The fall season in WMU 1A was decreased from 3 to 2 weeks in 2005 in response to below average spring harvest densities (it was 3 weeks from 2002–2004), and harvest densities continue to fluctuate (Tables 2, 6, 7, 9 and 10). The 2010 spring harvest density was above average, but with below average summer sighting indices in 2008, the 2011 spring harvest density decreased to the lowest on record, demonstrating the importance of poult recruitment on spring harvests 2 and 3 years following. The 2009 summer sighting index increased and the 2012 spring harvest density increased accordingly and was the third highest in the state. In WMU 1B, fall season length increased from 1 to 2 weeks in 1999, and the additional 3-day Thanksgiving holiday season began in 2010. The 2012 spring harvest density was the lowest on record, 55% below the 10-year average and below the state average. Therefore, we recommended decreasing the 2013 fall season length by one week.

The 2012 spring harvest density in WMU 2A was the second highest in the state, improved from the record low in 2010 and was similar to the previous 10-year average (Tables 6 and 7). However, the 2012 poult recruitment was 61% below average (Table 4). The fall season length decrease from 3 to 2 weeks in 2007 may be especially helpful during years of below average poult recruitment (Tables 4 and 9). WMU 2B in suburban Pittsburgh showed the third consecutive year of harvest densities below 1.0, and was 31% below the previous 10-year average (Table 7). The goal for this WMU is to keep nuisance complaints to a minimum and remain close to the state average harvest density (0.74). Nuisance wild turkey complaints continue, but at a low rate, suggesting that the wild turkey population remains slightly above the social carrying capacity. WMU 2C spring harvest density increased from 2011 and was above the 10-year average as expected due to the increase in summer sightings in 2010. Fall season length was decreased from 3 to 2 weeks in 2004. The 2012 spring harvest density in WMU 2D decreased from 2011 and was below average, but recruitment ratio increased (Table 4). With the shortened season to 2 weeks in 2009 the population may need a few more years of above average recruitment for harvests to improve. Spring harvest density in WMU 2E has been variable, but so has recruitment (Tables 4 and 7). With the above average poult recruitment in 2010 the 2012 spring harvest density was above the state average, for only the second year. In WMU 2F the fall season was shortened from 3 to 2 weeks (2007-2009) to help the population recover to early 2000s levels (Table 10). Summer sighting indices were above average from 2008-2010 (Table 2). The season was increased again to 12 days + 3 days in 2010 and to 3 weeks + 3 days in 2011. The 2011 summer sighting index was 16% below the 10-year average. However, the index increased again in 2012. The 2012 spring harvest density was again above average possibly in response to the above average 2008 - 2010 summer sighting indices. WMU 2G has displayed spring harvest densities which are consistently below the state average and was below its 10-year average from 2009-2011, but the 3-week fall season has been maintained for the hen turkey survival and harvest rate study with recommendations to change seasons in 2013 and 2014 (Casalena 2011). The 2012 spring harvest density was above its 10-year average, but still below the state average.

Fall seasons in all the WMUs in physiographic region 3 have traditionally been 3 weeks. Spring harvest densities in WMU 3A have been above the state average since 2006, and the 2012 harvest density was above average for the WMU possibly due to an increase in the 2010 summer sighting index (Table 6, Table 7). However, summer sighting indices for the last 2 years are 51% lower than the record highs from 2005 – 2007 (Table 2). The additional 3-day Thanksgiving season since 2010 coupled with low recruitment may be limiting this population and future fall season restrictions may be warranted according to wild turkey management plan guidelines. WMU 3B spring harvest densities have been below the 10-year averages since we initiated the 3-day Thanksgiving fall hunting season in 2010, and below the state average since 2011, whereas it previously had been at or above the state average since 2006 (Tables 6 and 7). The 2012 summer sighting index was 41% below the previous 10-year average (Table 2). Although poult recruitment increased in 2012 it also remained below average (Table 4). The added 3-day harvest coupled with low recruitment may be limiting this population also. Although summer sighting indices in WMU 3C remain above the state average they have been below average for the WMU and continually decreasing since 2008 (Table 2). Even though spring harvest densities have remained above the state average since 2001, and the highest in the state in 2012, they have been fluctuating since the record high in 2009 (Tables 6 and 7). The added 3-day Thanksgiving season

coupled with low recruitment may be limiting this population as well. The 2012 summer sighting index in WMU 3D was 60% below the previous 10-year average and the lowest since 1996 (Table 1, Table 2). Spring harvest densities have been below average and decreasing since 2008, record low in 2012, and have been below the statewide average since 2010; previously it had only been below the statewide average in 1998 and 1995 (Tables 6 and 7). Spring harvest densities are expected to remain low due to the below average summer sighting indices in 2011 - 2012. If population indices do not improve by 2014 for these WMUs, we will recommend reducing the 3-week fall season to help the population recover in accordance with wild turkey management plan guidelines.

Fall season length was decreased to 2 weeks in WMUs 4A, 4B and 4D in 2004 to provide a larger carry-over of the population into the spring nesting season (Table 10). Since then summer sighting indices in WMU 4A increased to a record high in 2007 and have since decreased annually falling below the statewide average in 2012 (Table 2). Spring harvest densities also have been decreasing since the record high in 2009, but in accordance with the hen turkey survival and harvest rate study we will recommend increasing season length by 1 week in 2013 and 2014 (Casalena 2011). Spring harvest densities in WMU 4B fluctuate substantially according to fluctuations in summer sighting indices 2 years prior. The fall season in WMU 4D was returned to 3 weeks from 2007 – 2009, and then decreased to 2 weeks in 2010 as part of the hen turkey survival and harvest rate study (Casalena 2011). Spring harvest densities have been somewhat variable since 1995, possibly due to the frequent changes in fall season length and variable summer sighting indices, with the record high summer sighting index in 2008 most likely influencing the high spring harvest densities in 2009 and 2010. Results from the hen study will help determine if 2-week fall seasons are warranted in these WMUs. Fall seasons in WMUs 4C and 4E have been 3 weeks since 2000 (Table 10). Even though summer sighting indices in WMU 4C remain below the statewide average, spring harvest densities remain above the statewide average, although they are expected to decrease in 2013 due to below average summer sighting indices in 2010 and 2011. Spring harvest densities in WMU 4E also have been decreasing in conjunction with the decreasing summer sighting indices since the high in 2008. Spring harvest densities remain above the state average, but summer sighting indices have fallen below average (Tables 2 and 7).

The fall season in WMU 5A was closed from 2003-2009, with a 3-day fall season since 2010 (Table 10). The 2012 spring harvest density was again below the previous 10-year average, but this may be related more to conflicting activities on the state forest during the season than to population levels (Roy Brubaker, Bureau of Forestry, pers. comm.; Tables 2 and 7). With the above average summer sighting index in 2011, the spring harvest density in 2013 is expected to increase, especially because the conflicting activities have been eliminated. The fall season in WMU 5B has been closed ever since population restoration efforts (2001-2003) with in-state transfers of 515 wild turkeys (Table 10). Summer sighting indices are low and fluctuate substantially according to annual poult recruitment (Table 2). The record high spring harvest density in 2012 most likely was still the effect of the above average 2009 recruitment and summer sighting index (Table 7). If spring harvest densities and summer sighting indices remain above the long-term average in 2013 an experimental conservative fall season may be warranted, according to criteria in the wild turkey management plan (Casalena 2006). Fall seasons in WMUs 5C and 5D were decreased to 6 days (Saturday–Friday) from 2005-2008, but spring

harvest densities did not improve (Tables 6, 7 and 10). Seasons were decreased to 4 days in 2009 and closed in 2010 to aid in population recovery. The 2012 spring harvest density in WMU 5C was a record low and 56% below the 10-year average (Table 7). WMU 5D is mostly suburban and urban so spring harvest densities likely fluctuate according to recruitment and hunter access more than from fall season length. Fall seasons in WMUs 5C and 5D should remain closed until population indices improve substantially for three consecutive years, according to criteria in the wild turkey management plan (Casalena 2006).

Fall Harvest Trends

The number of fall turkey hunters continued to decrease in 2012 and was 14% below 2011 (125,262 and 144,734, respectively). The 2012 figure decreased 19% from the previous 3-year average (154,973) and 31% from the previous 10-year average (182,338) demonstrating the steady decrease in fall turkey hunting participation. Days hunted also decreased (418,564 and 443,254, respectively), with a 12% decrease from the previous 3-year average (476,705) and a 30% decrease from the previous 10-year average (598,694). The addition of the 3-day Thanksgiving holiday turkey season is in place to stimulate hunter participation. Hunter success in 2012 (12%) increased from 2011 (10%), and the previous 3-year average (11%), but was 17% below the previous 10-year average (14%). Hunter success has been as high as 21% (2001, a year with excellent recruitment), and as low as 4% (1979). Shorter seasons over the past 9 years, below average recruitment and substantial mast crops (which tend to disperse flocks and make them more difficult to locate) may have contributed to the decreased harvest and hunter success, as well as a gradual shift in hunter preferences to other concurrent hunting seasons, as observed in an independent survey conducted in 2004 (Responsive Management 2004). Fall turkey hunters and days hunted have been decreasing since the mid 1990s. Fall hunter density has decreased from 10.7 hunters per square mile in 1980 to the current 2.8. Hunter density has been less than 5 since 2002. Possibly related to this lower hunter density, 2012 was the safest year for both wild turkey seasons with no fall turkey hunting related shooting incidents (previous 10-year average was 4), and 3 non-fatal spring turkey hunting related shooting incidents (previous 10-year average was 7). Spring hunter density has averaged 5 hunters/mi^2 since 1984. From 1978-1983 it averaged 6.2 hunters/mi^2. The decrease in spring turkey hunting related incidents may also be related to increased hunter education efforts.

The final fall 2012 turkey harvest was 14,904 birds, which was 4% above the final 2011 harvest (14,383), but 13% below the previous 3-year average (17,125) and 44% below the previous 10-year average (26,714; Table 5). This was not as sharp a decline as 2011 when that harvest was 52% below the 10-year average. Average harvest density by WMU (0.31 turkeys harvested/mi^2) was the lowest on record. Although similar to 2011 (0.32), it was 24% below the previous 3-year average (0.40), 42% below the previous 10-year average (0.53), and the 9th consecutive year below 0.60 turkeys/mi^2 (Table 11). Harvest densities in most WMUs were below the 3-year average.

Fall harvest per unit effort (success) has generally followed the normalized summer turkey-sighting index, showing how fall harvests often track summer production (Fig. 1). From 1990-2001 fall harvest per unit effort showed a sharply increasing trend, then from 2002-2005 it declined sharply, increased again from 2006-2008 and decreased again from 2009 to present, following the summer sighting ratio. However, during some years (e.g., 2002 and 2004) these 2

indices were not well correlated and other factors may have affected hunter success (mast crop, weather, season length, etc.). The adjusted hunter success (success/normalized summer sighting index) is not well correlated with the normalized summer sighting index.

Even though fall harvests have been declining in Pennsylvania, the fall hunting tradition remains strong, especially when compared to the other 11 states in the northeast which offer fall turkey seasons (no fall season in Delaware). Pennsylvania exhibits the highest 10-year average fall harvest, 22,260, followed by New York, 9,700, and Virginia, 4,300 (Massachusetts Division of Fisheries and Wildlife 2013).

Age Distribution of Spring Harvest
According to Game Take Survey data, the prominent age class of the spring harvest from 2003-present has been the 3+ year-old age class male turkeys (range 41-50%, Fig. 2). The 2-year age class comprised 27–39% of harvests, whereas 1-year-old males (jakes) comprised 10%-29% of harvests. Bearded females comprised 3–6% of harvests. Results from the tri-state gobbler harvest rate study substantiate hunter preference for harvesting adult gobblers over juveniles; Pennsylvania spring harvest rates from 2006–2009 averaged 25% for juvenile and 38% for adult males (Diefenbach and Vreeland 2010). Hunter preference for the older age class also is supported through the summer sighting data (Table 2). The index showed above average summer sighting indices from 2006-2008, indicating a high proportion of four-year and older males in the spring 2012 population. The 2010 summer sighting index was below average, but there still were an above average percent of two-year old gobblers in the 2012 harvest (Fig. 2). The 2011 summer sighting index was well below average with few jakes available for harvest, thus the 2012 harvest comprised only 13% jakes, but 84% adult males (3% bearded females). This compares to an average of 28% juveniles and 72% adults for the other northeastern states (Massachusetts Division of Fisheries and Wildlife 2013). Juvenile harvest ranged from 24% in Maryland, with a strong gobbler hunting tradition to 32% in New Hampshire. Age structure varies by year and reflects hunter preference for harvesting adults, as well as the productivity from the previous years.

Sex and Age Distribution of Fall Harvest
According to Game Take Survey data, and consistent with harvests from other states, female wild turkeys comprise almost two-thirds of the fall harvest from 2006-2012, on average (Fig. 3; Massachusetts Division of Fisheries and Wildlife 2013). Juvenile males, on average, comprised approximately 14% of the fall harvest from 2006-2012, followed by 2.5 year old males at approximately 12% of the fall harvest, and 1.5 year old males at approximately 7% of the fall harvest, on average. Flock behavior is the main reason why females and juvenile males comprise over three-quarters of the fall harvest as brood flocks are still maintained during the fall wild turkey season.

Spring Harvest by Week
The 2012 spring youth hunt accounted for an average 8% of the overall reported harvest by WMU (range 0-14%), which was average (Table 12, Fig. 4). During the regular season 44% of the harvest by WMU occurred from opening day of the regular season (Saturday following the youth hunt) through the first Friday (range 41-50% by WMU), which is similar to the average. Typically the 5-day (first Monday–Friday) harvest surpasses opening day harvest, as was the

case in 2012. With a significant percentage of the harvest occurring during the first week, maintaining the opening of the season to coincide with the peak of incubation is important for protecting hens from illegal or mistaken kills and disturbance prior to nest incubation.

The harvest declined considerably after the first week, similar to previous years (Table 12, Fig. 4). Eight percent of the harvest occurred the second Saturday (previous average was 6%), 12% during the second Monday–Friday (similar to previous average), and 4% during the third Saturday (similar to previous average). Harvest during the third week was 9% (similar to previous average); 2% of the harvest occurred on the fourth Saturday (previous average was 4%); 6% during the fourth week (previous average was 8%) and 2% during the last Saturday, (previous average was 3%). In 2008 the season was extended to Memorial Day, and this day accounted for 1.1% of the 2012 harvest (previous average was 1.8%) and ranged from 0–9% of the harvest by WMU. In 2011 the season was extended to May 31 and these extra days accounted for 2% of the overall harvest (range 1-9% by WMU). The second half of the season averages about one-quarter of the harvest demonstrating that, although harvest decreases, hunting participation persists throughout the season.

Fall Harvest by Week

For the third year the fall season comprised two season segments (Table 10). The first segment opened during the normal time period, comprising 2 weeks (3 Saturdays) in 9 WMUs and 3 weeks in 9 WMUs (closing on a Friday to accommodate the opening of rifle black bear season on Saturday). The second segment was Thanksgiving and the subsequent Friday/Saturday. One WMU had a 3-day season during the first segment and the season was closed both segments in 3 WMUs.

Similar to the spring season the highest harvest days during the 2012 fall season were opening day (18% of the harvest on average) followed by the first Monday – Friday (16%; Table 13). During 2012, 37% of the harvest occurred between opening day and the first Friday of the season in WMUs with a 2-week first season segment, but was slightly lower in WMUs with a 3-week first season segment (33%), possibly because hunters had more time to hunt in the 3-week units (Table 13). Harvests decreased only slightly between the second and third weeks in the 3-week units (17% and 15%, respectively), demonstrating that hunters utilize the entire season. This year the Thanksgiving holiday season comprised a higher percentage of the overall harvest than in 2011 (22% and 19%, respectively). This further demonstrates hunter utilization of the entire season. Our turkey hunter surveys show that participation with new seasons typically increases over time as hunters become more familiar with the changes (Casalena et al. 2011). Continued monitoring of the second season segment is therefore important for proper turkey population management.

All-day Spring Season

Harvest results for the second year (2012) of all-day spring hunting during the second half of the month-long season were similar to 2011 (Fig. 5). Afternoon harvests comprised 5% of the total reported harvests (6% in 2011), and 20% of harvests during the all-day portion of the season (22% in 2011).

During the all-day season the majority of the harvest remained before 9:00 am, 57% (55% in 2011), and 80% of the harvest occurred by noon (78% in 2011; Fig. 5). For the afternoon segment, the majority of the harvest occurred between 5:00 – 8:00 pm. The latest reported harvest was 8:50 pm (8:35 in 2011). Hunting hours closed from 8:38 - 9:10 pm depending on location and week.

Season Proposals

As per staff recommendations the Board of Commissioners approved decreasing fall 2013 wild turkey season length in Wildlife Management Unit 1B from 2 weeks to 1 week to promote population growth, while maintaining the 3-day Thanksgiving season. The wild turkey hen harvest and survival rate study calls for 2 consecutive years of 1 fall season structure in each study area (2 weeks in Study Area 1 and 3 weeks in Study Area 2 during 2011 and 2012), then switching them for another 2 years (3 weeks in Study Area 1 and 2 weeks in Study Area 2 during 2013 and 2014). Therefore, the Bureau of Wildlife Management proposed, for fall 2013, to increase fall season from 2 weeks to 3 weeks in Study Area 1 (WMUs 2C, 2E, 4A, 4B and 4D), and simultaneously decrease the fall seasons in Study Area 2 (WMU 2F, 2G, and 2H) from 3 weeks to 2 weeks. Additional Board approvals were: maintain opening the fall turkey season in WMUs with 1 week or longer seasons on the 4th Saturday prior to Thanksgiving; close the 1- and 2-week seasons WMUs on a Saturday; close the 3-week season WMUs the Friday prior to the black bear season which opens the Saturday prior to Thanksgiving; re-open the fall season in the 1-, 2- and 3-week season WMUs on Thanksgiving for 3 days; maintain the 3-day (Tuesday – Thursday) fall season in WMU 5A for the fourth year; maintain fall season closures in WMUs 5B, 5C and 5D to help increase turkey populations in these units; and maintain the same spring season structure as established in 2011 with all-day hunting during the second half of the season and closing the season on 31 May.

RECOMMENDATIONS

1. I recommend continuing to conduct the WCO summer sighting survey, the WMU 5A weekly summer sighting surveys, and collecting spring and fall harvest trend data to provide a basis for monitoring wild turkey harvest and population trends, and for making turkey season proposals, as per strategies 1.1, 1.2, 1.3 and 1.5 in the Management plan for wild turkeys in Pennsylvania, 2006-2015 (Casalena 2006).

2. I recommend continuing to collect information on age distribution of the harvest as a way to monitor the age structure of the population as per strategy 1.4 in the Management plan for wild turkeys in Pennsylvania, 2006-2015 (Casalena 2006).

3. I recommend continuing to collect harvest data by day to determine the influence of season day and the effect of different season lengths for helping to guide season length proposals, as per strategies 1.1, 1.2 and 4.5 in the Management plan for wild turkeys in Pennsylvania, 2006-2015 (Casalena 2006).

4. I recommend maintaining the hen harvest and survival rate study to 2014 in order to obtain 2 years of hen harvest rates with the same season structure (2011-2012), and then obtain 2 years of hen harvest rates with a different structure (2013-2014). This design allows us to

determine the effect of fall season length on hen harvest rates for ultimately making future season recommendations. Hen harvest rate data are needed to make informed fall season proposals, as per strategy 1.9 in the Management plan for wild turkeys in Pennsylvania, 2006-2015 (Casalena 2006).

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Table 1. Pennsylvania turkey summer sighting index values (average number of wild turkeys seen/1,000 mi driven by WCOs) by Pennsylvania WMU and the state average, 1995 – 2004.

WMU	1995	1996	1997	1998	1999	2000	2001	2002	2003[a]	2004
1A	30.7	16.8	18.4	38.0	39.3	52.0	45.6	39.8	35.5	77.9
1B	70.6	39.3	36.8	43.9	67.9	39.4	41.8	45.4	35.4	33.4
2A	35.7	51.6	37.9	47.8	74.5	140.3	58.8	54.3	47.6	45.0
2B	7.1	11.8	8.4	11.7	9.5	9.0	8.8	68.1	59.5	94.8
2C	10.7	12.8	3.8	10.9	19.1	16.1	21.9	16.9	8.4	8.7
2D	18.7	9.8	16.0	16.3	24.1	26.4	11.6	28.2	21.2	18.2
2E	18.3	2.4	9.3	9.0	29.8	47.5	42.6	29.0	20.0	19.7
2F	29.5	20.5	18.8	39.3	63.9	20.5	50.7	34.3	21.6	20.1
2G	30.2	18.8	18.4	24.6	31.7	54.7	60.2	40.2	21.8	22.6
3A	41.4	29.2	29.1	13.3	30.4	25.8	45.7	56.9	25.7	27.9
3B	21.8	5.7	19.7	19.4	21.3	17.1	21.9	19.0	16.4	14.9
3C	37.4	16.5	34.4	24.3	52.6	22.1	37.4	31.1	24.9	27.8
3D	23.2	11.7	17.2	24.7	44.7	25.6	39.3	77.8	24.9	26.6
4A	29.7	23.1	32.8	23.6	28.0	39.0	45.6	37.5	10.8	79.9
4B	14.7	9.1	4.2	4.5	15.1	44.2	39.4	30.9	7.3	42.7
4C	8.6	13.5	23.7	8.7	12.7	8.8	8.1	15.5	10.9	11.9
4D	13.1	8.8	3.8	9.3	7.4	18.1	11.3	17.8	10.5	12.4
4E	4.1	10.5	8.9	18.7	17.9	10.5	12.9	20.1	14.3	21.9
5A	8.0	3.9	0.0	2.7	2.4	0.9	5.5	9.3	1.5	2.3
5B	5.5	10.9	5.0	2.2	6.1	3.7	5.6	6.2	2.5	6.1
5C	5.8	10.9	11.0	9.8	11.9	49.6	16.6	9.4	9.8	5.3
5D	1.4	2.0	0.1	0.0	0.6	1.8	2.3	7.3	19.7	3.3
State Average	22.4	16.4	16.5	19.1	28.1	30.3	29.4	31.1	19.2	24.8

[a] In 2003 TMA were changed to WMU. Data prior to 2003 were collected by TMA and converted to WMU.

Table 2. Pennsylvania turkey summer sighting index values (average number of wild turkeys seen/1,000 mi driven by WCOs) by Pennsylvania WMU and the state average, 2005 – 2012. For comparisons with the current year, averages are provided by the previous 3-year average and previous 10-year average. Prior to 2005, if a WCO district contained >1 WMU all data were assigned to the one WMU that comprised the largest amount of the district. Since 2005 mileage and turkey sighting data were reported for each WMU, up to 3 WMUs per WCO district.

WMU	2005	2006	2007	2008	2009	2010	2011	2012	Prev. 3Yr.Avg	Prev.10Yr Average
1A	28.8	37.6	18.2	12.4	16.3	13.1	11.1	11.4	13.5	29.1
1B	41.6	37.2	30.7	46.5	32.3	33.7	29.2	17.6	31.7	36.5
2A	28.7	37.9	40.0	23.5	27.2	46.5	46.6	34.9	40.1	39.7
2B	18.8	31.7	24.9	16.4	16.7	7.8	35.0	14.8	19.8	37.4
2C	11.7	17.1	16.9	15.9	15.5	18.7	18.0	22.9	17.4	14.8
2D	11.3	13.0	11.7	8.9	12.9	13.7	13.9	13.2	13.5	15.3
2E	12.8	32.4	44.5	18.1	45.1	26.5	17.3	26.5	29.6	26.5
2F	21.1	24.4	24.3	37.0	30.7	34.8	24.4	31.5	29.9	27.2
2G	23.0	32.0	40.5	23.3	32.9	26.3	18.3	17.1	25.8	28.1
3A	68.8	66.7	71.0	40.8	27.7	42.4	30.3	36.6	33.5	45.8
3B	11.8	19.2	20.7	39.1	25.7	21.8	24.7	12.7	24.1	21.3
3C	65.4	67.5	77.5	44.3	40.6	34.0	24.6	21.8	33.0	43.8
3D	38.2	36.1	31.2	35.1	27.9	35.6	16.9	13.9	26.8	35.0
4A	38.4	29.2	57.1	39.0	37.3	22.1	20.5	13.1	26.6	37.2
4B	5.3	9.6	11.8	5.8	2.5	3.6	14.1	8.9	6.7	13.3
4C	9.6	11.7	7.5	16.1	19.6	16.8	16.2	14.1	17.5	13.6
4D	16.1	13.0	19.9	33.8	17.7	16.6	14.8	22.7	16.4	17.3
4E	20.0	25.3	23.1	36.9	29.8	17.2	17.7	14.4	21.5	22.6
5A	4.8	3.2	3.0	5.1	1.5	4.7	6.3	2.8	4.2	4.2
5B	2.8	2.8	1.7	2.8	7.4	2.7	4.0	5.1	4.7	3.9
5C	10.4	7.7	5.5	2.1	2.0	5.7	4.6	3.1	4.1	6.2
5D	0.7	0.0	9.5	8.2	1.2	2.1	2.4	0.4	1.9	5.4
State Average	20.3	24.7	25.3	24.0	21.6	20.8	18.3	16.8	20.2	23.0

Table 3. Comparisons between 2011 and 2012 for turkeys seen/1,000 mi by WCO, percentage of change between years, the statistical *P*-value, whether the change was statistically significant (using an alpha level of 0.10), and the type of change for each WCO district index by Pennsylvania WMU during June, July, and August.

WMU	Turkeys/ 1,000 mi [a]		% Change 2011/2012	*P* Value	Significant Change	Changes in District Indexes For 2012		
	2011	2012				Higher	Lower	Same
1A	11.3	8.9	-20.9	0.441	No	4	5	1
1B	33.7	20.0	-40.7	0.059	Yes	3	7	0
2A	45.3	30.0	-33.7	0.203	No	4	6	0
2B	29.0	23.6	-18.6	0.889	No	5	3	0
2C	15.3	17.7	15.6	0.695	No	5	7	0
2D	13.0	10.1	-22.1	0.433	No	5	7	1
2E	16.1	28.4	76.8	0.465	No	2	2	0
2F	13.5	24.3	79.5	0.066	Yes	7	2	1
2G	14.1	17.7	25.0	0.722	No	5	6	2
3A	29.5	26.0	-11.8	0.273	No	1	3	1
3B	24.5	13.0	-46.8	0.310	No	3	4	0
3C	31.3	21.3	-31.8	0.173	No	1	5	0
3D	17.0	17.8	4.9	0.779	No	4	4	0
4A	31.1	17.0	-45.3	0.249	No	2	4	0
4B	15.7	6.5	-59.0	0.116	No (almost)	1	5	2
4C	18.0	21.5	19.4	0.953	No	5	4	1
4D	16.9	24.4	44.4	0.814	No	6	6	0
4E	26.0	24.7	-5.1	0.612	No	2	5	3
5A	8.9	4.5	-49.3	0.465	No	1	3	1
5B	3.3	4.4	31.6	0.386	No	5	5	1
5C	3.9	2.9	-25.9	0.066	Yes	2	7	3
5D	1.9	0.3	-86.2	0.317	No	0	1	4
State	19.1	16.6	-12.9	0.441	No	73	101	21

[a] Index values represent matched districts for the 2 years being contrasted; consequently, they may differ from values appearing in other tables of this report.

Table 4. Wild turkey productivity, as determined by juveniles per hens seen with broods and recruitment ratio, shown as the proportion of juveniles entering the population per total number of hens in the population, by WMU in Pennsylvania, 2008-2012.

WMU	Juveniles per Hens w/Broods (June+July)					Juveniles per All Hens (June+July)				
	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
1A	4.90	7.86	4.86	3.67	3.46	1.85	1.79	1.51	0.59	1.29
1B	5.45	3.06	3.92	1.71	3.42	2.29	1.30	1.76	0.21	1.65
2A	5.90	5.41	4.67	4.16	3.23	2.32	2.98	2.38	2.02	0.81
2B	3.33	3.25	4.17	4.54	3.74	2.20	0.60	1.00	1.33	1.07
2C	4.54	6.13	3.59	5.12	4.37	2.38	4.89	1.92	2.54	1.82
2D	3.20	3.44	4.06	3.67	2.83	0.76	1.57	1.92	1.05	1.74
2E	3.90	4.47	1.86	4.79	4.46	1.41	0.82	1.67	2.39	0.81
2F	5.58	3.00	4.42	4.54	4.89	3.48	1.87	2.70	2.47	1.95
2G	5.80	6.05	5.35	4.46	3.75	2.61	2.64	3.40	1.07	1.55
3A	5.26	4.06	4.70	4.20	5.88	3.69	1.96	2.31	2.25	2.00
3B	4.93	4.17	4.92	3.33	3.11	2.86	2.71	1.78	0.94	1.18
3C	4.34	3.13	5.29	4.36	5.90	1.74	1.94	1.65	1.41	1.53
3D	5.23	3.33	4.08	4.00	4.44	2.42	1.10	2.08	1.71	1.38
4A	4.68	4.47	2.24	4.00	3.41	2.29	2.11	1.74	2.50	1.94
4B	5.33	4.00	2.14	3.95	3.50	5.33	3.33	0.83	2.55	1.67
4C	3.95	3.93	3.43	6.22	4.56	2.51	2.81	2.45	1.51	2.63
4D	5.07	2.67	4.37	3.63	5.10	2.88	0.63	1.90	1.15	2.69
4E	4.81	4.31	5.16	4.43	4.23	3.59	2.88	3.02	2.18	2.92
5A	8.75	5.00	4.44	3.80	2.25	6.25	5.00	2.35	3.80	1.50
5B	4.90	5.26	5.88	3.75	2.70	2.72	3.72	4.27	0.88	1.15
5C	-	3.50	4.78	3.57	3.00	-	0.70	1.87	0.89	1.07
5D	4.00	-	0.00	0.00	-	0.80	-	0.00	0.00	0.00
State	4.96	4.20	4.14	4.23	3.92	2.56	2.21	2.16	1.56	1.56

Table 5. Pennsylvania spring and fall wild turkey harvests, by WMU, determined from Game Take Surveys, 2006 - 2012. Spring harvests include initial harvest + second bird harvests. Second bird allowed with purchase of special spring license beginning 2006. Beginning spring 2011 season open through May 31 and all-day hunting permitted last two weeks of season.

| WMU | Spring | | | | | | | Fall | | | | | | |
	2006	2007	2008	2009	2010	2011	2012	2006	2007	2008	2009	2010	2011	2012
1A	1,674	2,185	1,305	2,163	2,366	1,660	2,608	1,015	805	745	1,430	531	433	477
1B	2,312	3,183	2,878	3,372	2,701	2,468	1,358	1,626	1,006	1,598	1,634	1,329	693	860
2A	2,685	1,692	2,293	3,321	1,414	2,613	2,384	1,321	1,208	533	613	886	347	764
2B	1,853	1,385	2,168	1,605	1,012	1,254	1,245	1,117	805	319	714	266	693	573
2C	2,363	2,357	2,191	1,752	2,275	2,111	2,492	915	1,309	1,065	1,634	798	866	1,051
2D	2,822	2,490	3,166	4,153	2,325	3,165	2,606	2,641	1,611	2,130	1,532	974	1,472	1,051
2E	1,134	335	1,163	1,035	575	1,202	1,248	609	1,006	1,065	919	798	693	764
2F	1,650	1,679	1,462	1,520	1,369	1,867	1,705	1,219	805	639	817	974	433	1,242
2G	2,387	2,302	3,061	2,566	1,795	2,009	2,834	2,539	2,315	2,342	1,634	1,684	1,733	1,624
3A	2,064	1,212	992	1,538	1,725	1,432	1,470	1,117	1,510	958	306	1,152	780	860
3B	2,268	2,175	2,533	3,129	2,295	1,556	1,697	711	1,409	958	1,327	798	693	956
3C	2,395	2,028	3,680	2,988	1,887	2,720	2,718	1,524	2,617	2,982	2,043	1,064	606	860
3D	2,177	2,467	2,006	2,525	1,298	1,358	796	711	704	958	511	709	693	287
4A	1,968	1,507	1,276	1,954	1,288	1,098	1,253	1,828	2,315	1,172	1,634	798	953	382
4B	2,067	1,397	1,097	1,548	1,375	857	1,246	1,321	1,006	1,065	511	709	433	573
4C	2,480	2,687	2,744	2,362	1,409	1,542	2,381	1,015	603	958	511	621	606	956
4D	1,463	2,180	2,830	2,467	2,772	2,107	1,810	1,524	2,315	3,088	1,430	886	1,559	477
4E	1,898	2,561	3,064	2,767	2,230	1,811	1,944	1,321	1,811	1,598	1,634	886	606	1,051
5A	412	774	730	314	457	456	458	0	0	Closed	Closed	195	92	96
5B	321	491	425	509	274	715	796	0	0	Closed	Closed	Closed	Closed	Closed
5C	895	797	1,242	830	1,007	967	574	387	201	107	102	Closed	Closed	Closed
5D	52	79	103	196	28	46	32	19	8	10	-	Closed	Closed	Closed
Unknown			28	27										
TOTAL	39,339	37,992	42,437	44,639	33,876	35,015	35,652	24,482	25,369	24,288	20,934	16,059	14,383	14,904

Table 6. Pennsylvania spring turkey harvest density trends (turkeys/mi^2) by WMU, 1995 - 2005 as determined from reported harvests corrected for reporting rate.

WMU	1995	1996	1997	1998	1999	2000	2001	2002	2003[a]	2004	2005
1A	1.57	1.33	1.31	1.26	1.46	1.69	1.88	1.47	1.52	1.31	0.97
1B	0.86	0.95	1.19	1.11	1.28	1.63	1.72	1.49	1.43	1.40	0.96
2A	1.71	1.50	1.44	1.36	1.62	1.83	2.01	1.47	1.59	1.44	1.10
2B	1.72	1.51	1.45	1.36	1.63	1.84	2.01	1.47	1.59	1.46	1.25
2C	0.75	0.70	0.74	0.75	0.78	0.87	1.05	0.81	0.72	0.73	0.65
2D	1.56	1.09	1.00	1.06	1.12	1.34	1.59	1.36	1.34	1.61	1.02
2E	0.73	0.67	0.70	0.72	0.75	0.84	1.02	0.79	0.71	0.77	0.60
2F	0.74	0.51	0.48	0.51	0.56	0.72	0.89	0.77	0.79	0.80	0.56
2G	0.61	0.48	0.46	0.49	0.58	0.67	0.82	0.72	0.76	0.56	0.40
3A	0.73	0.63	0.60	0.64	0.77	0.79	0.95	0.87	0.92	0.80	0.64
3B	0.81	0.76	0.71	0.75	0.91	0.91	1.07	0.98	1.05	0.94	0.63
3C	0.76	0.79	0.74	0.71	0.86	0.96	1.11	0.92	1.07	1.04	0.78
3D	0.76	0.80	0.75	0.70	0.86	0.98	1.12	0.92	1.08	0.92	0.79
4A	0.56	0.55	0.53	0.50	0.60	0.67	0.71	0.64	0.73	0.59	0.66
4B	0.56	0.56	0.53	0.50	0.61	0.67	0.71	0.64	0.74	0.78	0.83
4C	0.86	0.96	0.87	0.97	1.17	1.41	1.35	1.14	1.33	1.45	1.31
4D	0.59	0.57	0.55	0.53	0.62	0.70	0.76	0.67	0.73	0.60	0.47
4E	0.87	0.98	0.88	1.00	1.21	1.46	1.35	1.16	1.35	1.34	1.21
5A	0.35	0.37	0.26	0.22	0.26	0.31	0.47	0.36	0.41	0.39	0.33
5B	0.16	0.20	0.16	0.17	0.17	0.24	0.28	0.25	0.28	0.20	0.21
5C	0.50	0.59	0.58	0.55	0.62	0.78	0.86	0.81	0.78	0.76	0.74
5D	0.32	0.39	0.36	0.35	0.39	0.50	0.56	0.53	0.52	0.15	0.10
State Average	0.81	0.74	0.72	0.72	0.83	0.97	1.09	0.91	0.96	0.91	0.72

[a] In 2003 TMA were changed to WMU. Data prior to 2003 were collected by TMA and converted to WMU.

Table 7. Pennsylvania spring turkey harvest density trends (turkeys/mi^2) by WMU, 2006 to present. From 2006-2008 harvest densities were determined from reported harvests corrected for reporting rate. From 2009 to present harvest densities were determined from Game-Take Survey and Spring Turkey Hunter Survey data due to changes in reporting rates, which made annual comparisons invalid using reported harvests. Beginning 2006 hunters could harvest a second spring turkey with appropriate license, but data include only first harvests for comparison with previous years. For comparisons with the current year, averages are provided by the previous 10-year average.

WMU	2006	2007	2008	2009	2010	2011	2012	Prev. 10-yr Avg
1A	1.09	0.99	1.18	1.11	1.23	0.84	1.23	1.17
1B	1.27	1.24	1.37	1.51	1.19	1.09	0.59	1.30
2A	1.22	0.98	1.22	1.77	0.72	1.38	1.25	1.29
2B	1.28	1.16	1.07	1.14	0.70	0.88	0.83	1.20
2C	0.66	0.68	0.68	0.53	0.70	0.63	0.80	0.68
2D	1.16	0.99	1.23	1.60	0.88	1.21	1.00	1.24
2E	0.67	0.79	0.74	0.77	0.41	0.88	0.99	0.71
2F	0.47	0.54	0.55	0.60	0.54	0.75	0.71	0.64
2G	0.52	0.57	0.64	0.59	0.40	0.46	0.61	0.56
3A	0.94	0.82	0.93	0.97	1.10	0.91	0.97	0.89
3B	0.84	0.99	1.11	1.34	0.97	0.65	0.70	0.95
3C	1.04	1.08	1.23	1.31	0.81	1.19	1.26	1.05
3D	0.94	0.92	1.02	1.11	0.56	0.58	0.36	0.88
4A	0.81	0.73	0.89	1.06	0.70	0.59	0.66	0.74
4B	1.05	0.88	1.05	0.92	0.82	0.49	0.64	0.82
4C	1.36	1.27	1.40	1.23	0.72	0.79	1.19	1.20
4D	0.68	0.69	0.75	0.85	0.95	0.71	0.62	0.71
4E	1.37	1.21	1.49	1.51	1.21	0.98	1.12	1.28
5A	0.39	0.46	0.42	0.23	0.34	0.33	0.26	0.36
5B	0.28	0.25	0.28	0.18	0.09	0.25	0.29	0.23
5C	0.66	0.53	0.57	0.36	0.44	0.43	0.26	0.61
5D	0.07	0.09	0.07	0.23	0.03	0.05	0.04	0.18
State Average	0.84	0.80	0.90	0.94	0.70	0.73	0.74	0.84

Table 8. Spring wild turkey harvests as reported for each northeast state, 2002 - 2012 (Massachusetts Division of Fisheries and Wildlife, 2013).

State	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2012 vs. 5-yr Growth Rate [a]	10 Year Average	Kill/Sq Mi. Forest
Connecticut	1,894	2,367	2,081	2,016	1,760	1,601	1,558	1,502	1,245	1,424	1,364	-3.8%	1,692	0.50
Delaware			96	148	153	178	248	313	366	486	615	51.6%	289	1.03
Maine	3,395	3,994	4,839	6,236	5,931	5,984	6,348	6,043	6,077	5,405	6,079	1.3%	5,698	0.48
Maryland	3,127	3,120	2,760	3,136	3,008	2,455	2,833	2,910	2,847	2,826	3,132	7.6%	2,903	0.77
Massachusetts	2,026	2,217	2,068	2,276	2,266	2,481	2,689	3,027	2,747	2,857		3.5% [e]	2,465	
New Hampshire	2,631	2,599	2,706	3,040	3,559	3,649	4,098	4,056	3,667	3,672	3,873	0.0%	3,492	0.52
New Jersey	3,773	3,591	3,059	3,264	3,454	3,061	3,442	3,387	3,031	3,000	2,954	-6.6%	3,224	0.98
New York [b]	7,501	7,117	6,546	6,768	7,954	8,299								
New York [c]	39,300	36,800	26,300	24,910	27,745	35,635	32,936	34,664	25,807	18,738	19,000	-27.6%	28,254	0.62
Pennsylvania [d]	41,147	42,876	41,017	32,593	39,339	37,992	42,437	44,639	33,876	35,015	35,652	-7.0%	38,544	1.19
Rhode Island	256	275	220	207	234	195	203	206	163	151	104	-37.1%	196	0.21
Vermont	4,403	3,694	3,925	4,649	4,672	5,024	5,461	6,107	5,479	4,755	4,713	-11.1%	4,848	0.69
Virginia	18,345	17,988	14,338	14,355	17,195	14,090	15,037	16,611	15,190	15,689	15,326	-1.6%	15,884	0.61
West Virginia	13,385	12,535	10,573	10,957	11,710	9,976	9,895	9,787	10,209	9,190	8,303	-12.4%	10,822	0.46

[a] Growth rates: Trends with growth rates higher than 3% were considered increasing while those less than -3% were considered decreasing, and others were stable. (Virginia Department of Game and Inland Fisheries, personal communication).

[b] NY reported.

[c] NY calculated.

[d] Beginning 2006, includes harvests of a second bearded bird by hunters who purchase additional license, one bird per day. Harvest survey methods changed in 2010, reflecting more accurate harvest estimates.

[e] 2011 versus 5-year growth rate.

Table 9. Pennsylvania fall turkey hunting season lengths by TMA, 1990 – 2002.

TMA	Fall turkey hunting season lengths[a]												
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
1A	Closed	Closed	Closed	Closed	Closed	6 days	1	1	1	2	2	2	3
1B	Closed	Closed	Closed	Closed	Closed	6 days	1	1	1	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	3
3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	3	3	3	3	3	3	3	3	3	3	3	3	3
5	2	3	3	3	3	3	3	3	3	3	3	3	3
6	2	2	2	2	3	3	3	3	3	3	3	3	3
7A	3	3	2	2	2	3	3	2	2	2	3	2	3
7B	2	2	2	2	2	1	1	1	1	1	1	1	6 days
8	2	2	2	2	2	3	3	2	2	2	3	3	3
9A	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	3 days	Closed	Closed
9B	Closed	Closed	Closed	Closed	Closed	3 days	5 days	5 days	5 days	6 days	1	1	1

[a] Lengths recorded in weeks, unless otherwise specified.

Table 10. Pennsylvania fall turkey hunting season lengths by WMU, 2003 - 2012.

WMU	**Fall turkey hunting season length[a]**									
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
1A (Sh,B&A)[b]	3	3	2	2	2	2	2	6d + 3d	2wk + 3d	2wk + 3d
1B (Sh,B&A)[b]	2	2	2	2	2	2	2	6d + 3d	2wk + 3d	2wk + 3d
2A (Sh,B&A)[b]	3	3	3	3	2	2	2	6d + 3d	2wk + 3d	2wk + 3d
2B (Sh,B&A)[c]	3	3	3	3	3	3	3	12d + 3d	3wk + 3d	3wk + 3d
2C	3	2	2	2	2	2	2	6d + 3d	2wk + 3d	2wk + 3d
2D	3	3	3	3	3	3	2	6d + 3d	2wk + 3d	2wk + 3d
2E	3	2	2	2	2	2	2	6d + 3d	2wk + 3d	2wk + 3d
2F	3	3	3	3	2	2	2	12d + 3d	3wk + 3d	3wk + 3d
2G	3	3	3	3	3	3	3	12d + 3d	3wk + 3d	3wk + 3d
3A	3	3	3	3	3	3	3	12d + 3d	3wk + 3d	3wk + 3d
3B	3	3	3	3	3	3	3	12d + 3d	3wk + 3d	3wk + 3d
3C	3	3	3	3	3	3	3	12d + 3d	3wk + 3d	3wk + 3d
3D	3	3	3	3	3	3	3	12d + 3d	3wk + 3d	3wk + 3d
4A	3	2	2	2	2	2	2	6d + 3d	2wk + 3d	2wk + 3d
4B	3	2	2	2	2	2	2	6d + 3d	2wk + 3d	2wk + 3d
4C	3	3	3	3	3	3	3	12d + 3d	3wk + 3d	3wk + 3d
4D	3	2	2	2	3	3	3	6d + 3d	2wk + 3d	2wk + 3d
4E	3	3	3	3	3	3	3	12d + 3d	3wk + 3d	3wk + 3d
5A	Closed	Closed	Closed	Closed	Closed	Closed	Closed	3d	3d	3d
5B	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
5C (Sh,B&A)[c]	1	1	6d	6d	6d	6d	4d	Closed	Closed	Closed
5D (Sh,B&A)[c]	1	1	6d	6d	6d	6d	4d	Closed	Closed	Closed

[a] Lengths recorded in weeks, unless otherwise specified.
[b] Sh,B&A = Shotgun or bow and arrow only in WMUs 1A, 1B and 2A until 2012 when rifles were again permitted.
[c] Sh,B&A = Shotgun or bow and arrow only in WMUs 2B, 5C, and 5D.

Table 11. Pennsylvania fall turkey harvest density trends (harvest/mi^2) by WMU. Data from 1995 - 2008 were determined from reported harvests corrected for reporting rate. From 2009 to present harvest densities were determined from Game-Take Survey data due to changes in reporting rates, which made comparisons to reported harvests invalid.

WMU	1995	1996	1997	1998	1999	2000	2001	2002	2003[a]	2004	2005	2006	2007	2008	2009	2010	2011	2012	Prev. 10-yr. Avg
1A	1.27	0.93	0.83	1.19	1.27	1.69	1.21	1.29	0.87	0.74	0.52	0.48	0.50	0.62	0.71	0.40	0.45	0.48	0.66
1B	0.82	0.74	0.80	1.07	1.13	1.16	1.48	1.15	0.81	0.60	0.72	0.66	0.74	0.62	0.79	0.58	0.36	0.39	0.70
2A	1.34	0.88	0.77	1.13	1.31	1.75	1.11	1.20	0.83	0.65	0.61	0.46	0.39	0.47	0.36	0.31	0.34	0.35	0.56
2B	1.34	0.88	0.77	1.13	1.32	1.76	1.11	1.20	0.83	0.77	0.77	0.55	0.48	0.53	0.57	0.40	0.48	0.38	0.66
2C	1.34	0.93	0.86	0.97	1.03	1.04	1.33	0.91	0.67	0.57	0.47	0.45	0.54	0.47	0.44	0.36	0.40	0.40	0.53
2D	1.35	1.06	0.95	1.27	1.21	1.74	1.23	1.45	0.94	0.90	0.85	0.62	0.72	0.81	0.62	0.47	0.49	0.43	0.79
2E	1.32	0.90	0.85	0.95	1.01	1.02	1.32	0.90	0.67	0.82	0.62	0.65	0.64	0.76	0.81	0.57	0.54	0.55	0.70
2F	1.09	0.61	0.72	0.75	0.80	1.03	1.12	0.90	0.72	0.50	0.47	0.33	0.40	0.32	0.37	0.38	0.25	0.28	0.46
2G	1.09	0.51	0.68	0.63	0.74	0.85	1.14	0.79	0.65	0.47	0.59	0.49	0.56	0.59	0.55	0.46	0.34	0.33	0.55
3A	1.22	0.58	0.75	0.69	0.81	0.86	1.25	0.90	0.65	0.69	0.73	0.54	0.97	0.70	0.75	0.66	0.37	0.45	0.70
3B	1.23	0.61	0.79	0.71	0.84	0.84	1.28	0.94	0.64	0.74	0.75	0.62	0.80	0.58	0.72	0.51	0.27	0.31	0.66
3C	0.86	0.46	0.74	0.53	0.66	0.64	0.99	0.66	0.56	0.75	0.66	0.51	0.84	0.62	0.71	0.53	0.20	0.35	0.60
3D	0.81	0.44	0.73	0.51	0.64	0.62	0.95	0.63	0.55	0.40	0.52	0.44	0.44	0.35	0.30	0.22	0.18	0.16	0.40
4A	0.81	0.57	0.66	0.71	0.78	1.14	1.15	0.75	0.52	0.77	0.58	0.73	0.81	0.77	0.57	0.39	0.42	0.29	0.63
4B	0.81	0.58	0.66	0.71	0.78	1.14	1.15	0.75	0.52	0.90	0.78	0.80	0.70	0.55	0.41	0.45	0.43	0.34	0.63
4C	1.03	0.84	0.93	0.89	1.01	1.00	1.39	1.01	0.73	0.77	0.80	0.66	0.77	0.80	0.59	0.62	0.42	0.38	0.72
4D	0.91	0.62	0.69	0.74	0.81	1.10	1.18	0.77	0.55	0.52	0.58	0.63	0.78	0.96	0.60	0.51	0.46	0.39	0.64
4E	1.08	0.93	0.97	0.99	1.10	1.12	1.50	1.10	0.77	0.87	0.91	0.91	0.89	0.95	0.95	0.70	0.47	0.43	0.85
5A	0.39	0.19	0.21	0.23	0.29	0.48	0.41	0.24	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.07	0.06	0.06
5B	0.05	0.05	0.04	0.05	0.05	0.19	0.07	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
5C	0.28	0.27	0.24	0.27	0.28	0.45	0.38	0.25	0.19	0.19	0.16	0.13	0.13	0.12	0.08	0.00	0.00	0.00	0.12
5D	0.14	0.15	0.11	0.15	0.15	0.31	0.19	0.13	0.09	0.02	0.00	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.03
State Total	0.95	0.63	0.68	0.74	0.82	0.99	1.06	0.82	0.60	0.57	0.56	0.49	0.56	0.54	0.50	0.40	0.32	0.31	0.53

[a] In 2003 TMAs were changed to WMUs. Data prior to 2003 were collected by TMA and converted to WMU.

Table 12. Percentage (%) of Pennsylvania spring 2012 turkey harvests for each Saturday and each week (Monday–Friday) of the season, by WMU, calculated from reported harvest. The season ended on Memorial Day from 2008-2010 and May 31 beginning 2011. Does not include harvests from the special spring license, which allows for the taking of a second bird in the spring.

WMU	Youth Season	1st SAT	M-F	2nd SAT	M-F	3rd SAT	M-F	4th SAT	M-F	5th SAT	Memorial Day	Tu-Th
1A	7	19	26	8	12	4	8	2	6	2	1	3
1B	5	17	24	7	15	6	9	2	7	4	2	3
2A	7	26	24	7	12	4	8	3	4	1	2	2
2B	10	24	23	11	6	4	8	3	6	1	1	3
2C	7	14	28	9	10	6	10	2	5	2	2	6
2D	7	20	27	9	11	5	8	2	7	2	1	1
2E	8	15	26	6	15	5	9	2	8	2	2	3
2F	8	18	22	7	12	7	15	3	5	2	0	2
2G	7	16	30	8	12	4	9	3	6	2	1	2
3A	7	20	28	8	15	2	10	3	4	1	1	1
3B	8	17	32	7	13	4	5	2	7	1	0	2
3C	7	23	20	8	12	6	9	3	7	2	1	2
3D	8	22	23	9	11	2	10	2	7	3	2	1
4A	6	20	23	5	12	4	9	5	7	4	1	4
4B	14	18	27	7	11	7	6	2	5	1	1	1
4C	10	20	25	8	13	4	9	2	5	2	1	2
4D	7	18	26	6	12	4	12	2	8	2	1	2
4E	8	19	24	8	14	4	6	1	9	3	1	3
5A	10	20	29	7	10	2	11	1	4	2	1	3
5B	12	19	24	5	13	2	9	4	8	2	0	2
5C	9	24	23	11	12	4	5	3	2	4	3	2
5D [a]	0	18	27	9	18	0	0	9	0	0	9	9
State Average	8	19	25	8	12	4	9	2	6	2	1	2

[a] Low sample size

Table 13. Percentage (%) of Pennsylvania fall 2012 turkey harvests for each Saturday and each week (Monday–Friday) of the first season segment, and each day of the 3-day Thanksgiving holiday season segment, by WMU, calculated from reported harvest.

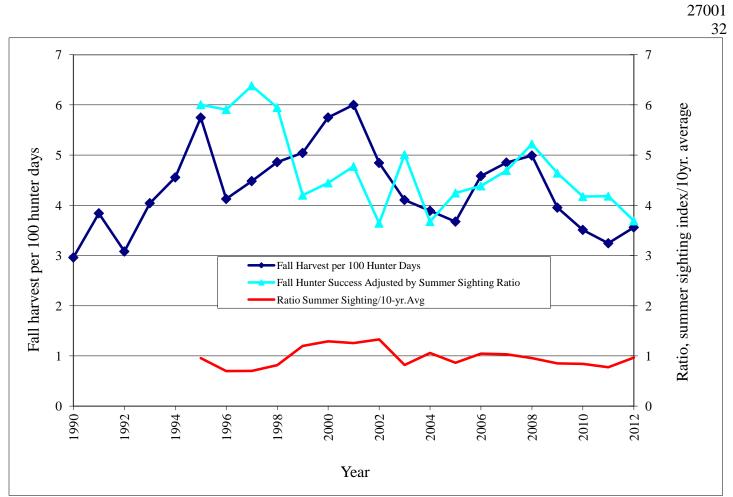| WMU	1st Sat.	Mon-Fri	2nd Sat.	Mon-Fri	3rd Sat.	Mon-Fri	Thanksg., Nov.22	Fri., Nov.23	Sat., Nov.24
1A	24	16	5	22	5	0	5	9	14
1B	20	16	8	15	12	0	10	9	10
2A	22	14	9	24	13	0	6	7	5
2B	18	9	6	16	9	23	7	4	8
2C	17	24	11	18	9	0	5	8	7
2D	22	19	8	19	8	0	7	7	10
2E	17	18	10	14	14	1	5	9	13
2F	17	17	8	17	6	16	4	6	10
2G	17	17	9	18	7	14	3	6	9
3A	18	12	8	15	5	16	3	6	18
3B	16	20	7	18	3	19	2	5	9
3C	15	13	11	16	7	16	7	7	9
3D	14	14	4	19	5	23	3	10	9
4A	15	19	14	20	12	0	5	7	7
4B	21	14	12	22	10	0	3	8	10
4C	23	16	7	15	4	12	4	9	9
4D	21	19	9	21	11	0	5	8	7
4E	13	15	11	19	6	15	5	9	7
5A	Closed	100	0	Closed	Closed	Closed	Closed	Closed	Closed
5B, 5C, 5D	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
Average, 2-week + 3-day	20	17	10	20	11	Closed	6	8	9
Average, 3-week + 3-day	17	16	8	17	6	15	5	7	10

Figure 1. Pennsylvania fall turkey harvest per 100 hunter days (success), the normalized summer sighting index (summer sighting/10-year average) and adjusted fall harvest/100 hunter days (success/normalized summer sighting index), 1990 - 2012.
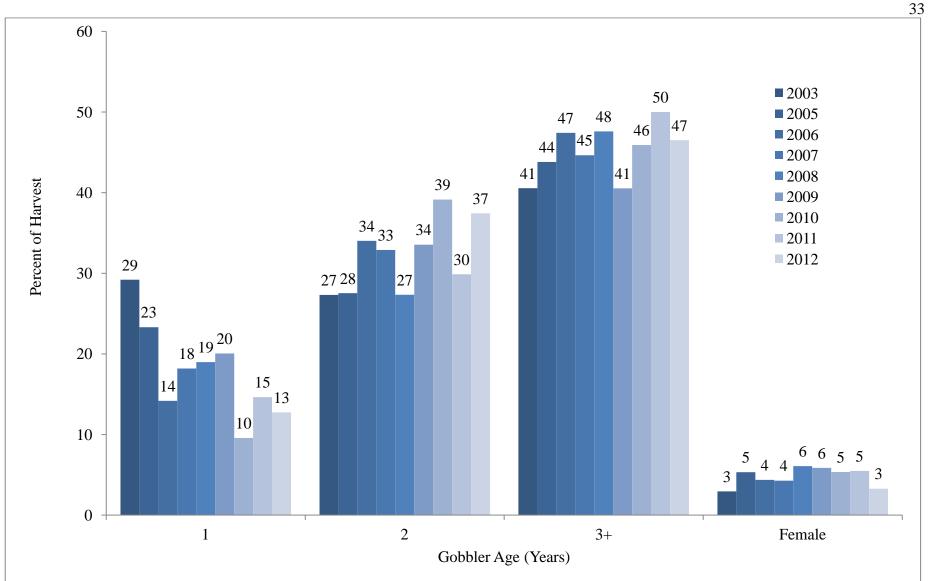
Figure 2. Gobbler age distribution and percent female turkeys, first bird only, in the Pennsylvania spring harvest from Game-Take survey results, 2003 – 2011 and Spring Turkey Hunter Survey, 2012. No data available for 2004. Beginning 2012 survey conducted immediately following the spring season to eliminate hunter memory bias and improve accuracy of reporting.
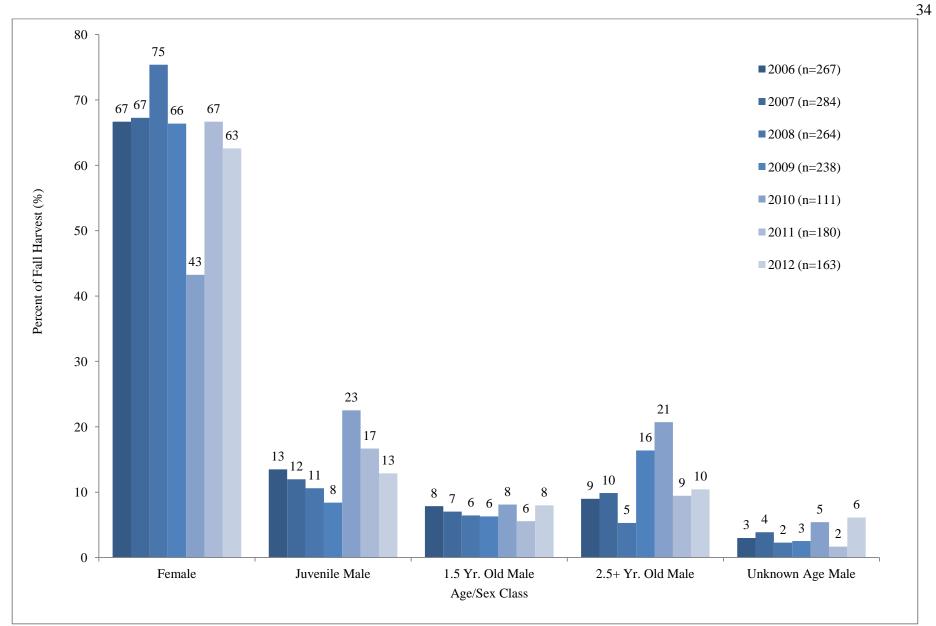
Figure 3. Wild turkey sex and age distribution in the Pennsylvania fall harvest, determined from hunter reports of sex and spur and beard lengths in Game-Take surveys, 2006 - 2012.
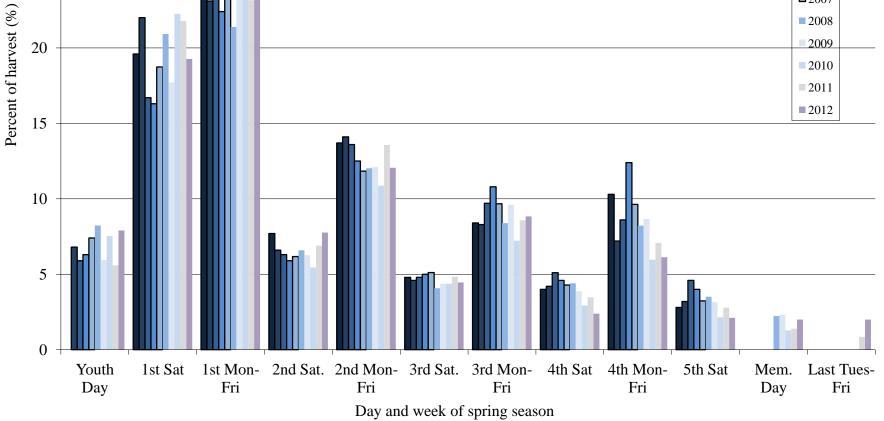
Figure 4. Percent of Pennsylvania spring turkey harvest by day and week, 2003 – 2012, calculated from reported harvest.

Harvest Time Distribution
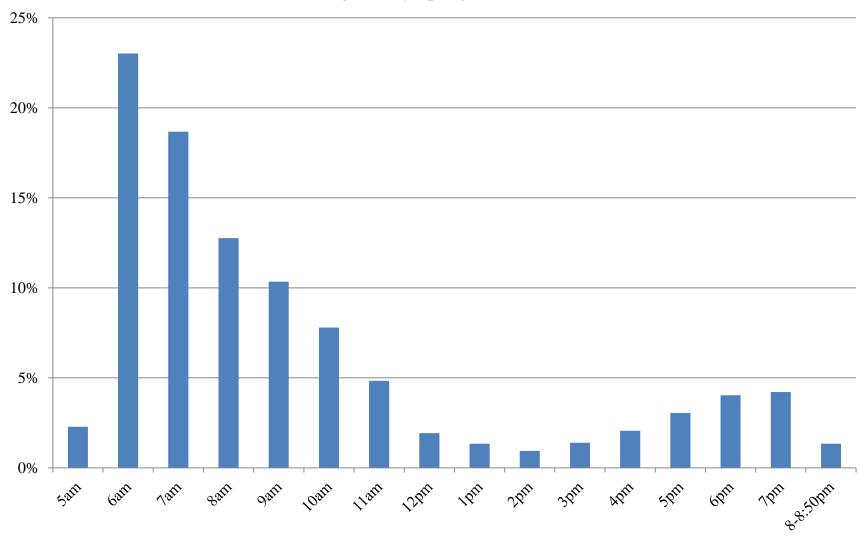During All-day Spring Season, 2012

Figure 5. Wild turkey harvest time distribution (%) during the all-day portion of the spring season, 2012, Pennsylvania, calculated from reported harvest. The 2012 season was the second year with all-day hunting during the second half of the season.